on them. While the author speaks of sterilizing the seeds with bromine, he says nothing about making cultures to assure that they are sterile. Many authors find it difficult to sterilize seeds without killing them. This is specially true of those with open micropyles. From the first two papers of the series, KIDD reemphasizes his conception that the dormancy of "moist seeds" is due to the anesthetic action of carbon dioxide which is held in by seed coats. If this be the cause of dormancy in any imbibed seeds, it is limited in its application. It does not apply to seeds which have a rest period during which the embryo is developing; to seeds like *Alisma* and *Amaranthus*, in which the swelling contents do not have sufficient pressure to break the coats; or to seeds like *Crataegus*, in which the embryos are dormant when naked.[12] He has by no means proved that this holds even for forms forced by increased oxygen pressure (*Xanthium* and others). His conception implies that the coats of these seeds are very slightly permeable to CO_2. In the elementary course in plant physiology in Hull Botanical Laboratory, we used for years various seed coats and the epidermis of various leaves to show that moist plant membranes are relatively very permeable to CO_2 in contrast to oxygen and nitrogen. KIDD's assumption concerning CO_2 and dormancy of seeds, therefore, even under limited application, cannot be considered more than an hypothesis without a study of the permeability character of the seed coats to CO_2 and other gases.—WM. CROCKER.

Vegetation of South Africa.—In a region where climate differs strikingly over areas of comparatively small size, there is usually a corresponding diversity of vegetation. Apparently such diversity is displayed to a remarkable degree in South Africa, as seen in the recent studies by BEWS. In his earlier papers, reviewed in this journal,[13] a general account of the vegetation of Natal was given and a more detailed study of some areas within its limits. In his latest article BEWS[14] has sketched the vegetation of a wider area and has begun the study of its succession. The condition of Table Mountain is perhaps typical of the broader area, showing a precipitation upon the western side of 60–75 cm. annually and resulting sclerophyllous scrub communities, while upon the eastern slopes the precipitation is doubled and a rather mesophytic forest results. The former characterizes the southwestern region of the Cape and passes from a fell field with an open stand of grasses, Crassulaceae, Compositae, and dwarf Ericaceae, to a heath dominated by *Blaeria ericoides*, a South African heather, or by a variety of dwarf shrubs in which species of *Protea*, *Erica*, *Rhus*, *Polygala*, and many less familiar genera, along with many bulbous monocotyledons, are conspicuous.

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[12] CROCKER, WM., Mechanics of dormancy in seeds. Amer. Jour. Bot. **3**:99–120. 1916.

[13] BOT. GAZ. **59**:68–69. 1915.

[14] BEWS, J. W., An account of the chief types of vegetation in South Africa, with notes on the plant succession. Jour. Ecol. **4**:129–158. 1916.

A related formation of higher growth is the "macchia," which in some regions succeeds the heath. In it the Ericaceae become less abundant with the increase in size of the woody plants, but such genera as *Protea* and *Rhus* have more representatives, while associated with them are species of *Olea*, *Celastrus*, *Leucadendron*, and many other genera.

On the southeastern slopes facing the Indian Ocean, the greater summer rainfall produces a mesophytic forest, often dominated by *Podocarpus* or by *Rhus longifolia* and *Albizzia fastigiata*.

Grassland, much of it interspersed with scattered trees or shrubs, known variously as *Acacia* veld, *Protea* veld, or bush veld, extends through much of Natal, Transvaal, and Rhodesia. The tree veld becomes increasingly arid toward the west and includes much of Great Namaqualand and Damaraland. Northward the vegetation becomes more luxuriant, passing to rich grasslands with large trees of the baobab, *Adansonia digitata*, and of *Copaifera mopane* in Angola.

In dry river valleys of Natal and elsewhere, a rather rich scrub formation is found, characterized by tree species of *Euphorbia*, *Aloe*, and *Mesembryanthemum*, and succulent or semisucculent lianas, in addition to the more woody shrubs and trees.

Finally, there is the Karroo with a rainfall of 8–35 cm., and a vegetation of dwarf shrubs, leaf and stem succulents, bulbous plants, a few grasses, and some annuals. BEWS is inclined to class this with the grassland rather than with the desert. He finds, in fact, that there is little true desert in South Africa, the so-called "Kalahari desert" also being more truly veld or grassland.—GEO. D. FULLER.

Effect of fungi on fruits.—HAWKINS[15] has studied the effect of the brown-rot fungus upon the chemical composition of the peach, and CULPEPPER, FOSTER, and CALDWELL[16] have made a similar but more complete study of the changes in the apple during decay by the black-rot fungus. *Sclerotinia cinerea* increases acidity of the peach during decay. Among the carbohydrates the pentosans are not attacked; the alcohol-insoluble portion which reduces Fehling's solution after being hydrolyzed with dilute hydrochloric acid is slightly decreased; and the total sugar content is much decreased. The sucrose practically disappears during decay; its inversion occurs more rapidly than the resulting reducing sugars are used by the fungus. As a result, the percentage of reducing sugars in the decaying fruit is greater than in the sound fruit, although the total sugar content is less.

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[15] HAWKINS, LON A., Some effects of the brown-rot fungus upon the composition of the peach. Amer. Jour. Bot. **2**:71–81. 1915.

[16] CULPEPPER, CHARLES W., FOSTER, ARTHUR C., and CALDWELL, JOSEPH S., Some effects of the black-rot fungus, *Sphaeropsis malorum*, upon the chemical composition of the apple. Jour. Agr. Research. **7**:17–40. 1916.